

CLAIMS

1. An image processing device that displays the behavior of characters modeled on opponents in virtual three-dimensional space, wherein said image processing device is characterized by comprising:

determination means for determining whether or not there exists a certain situation in which the relation to the game contents or the positional relation between characters and a target having a relation through the game to said characters matches certain conditions; and

eye direction control means for directing the eyes of said characters to said objects when the determination means has determined said certain situation exists.

2. The image processing device according to Claim 1, wherein said game is a soccer game, and said object is a ball in said soccer game.

3. The image processing device according to Claim 1, wherein said eye direction control means includes means for rotating and controlling the torsos and waists of said characters with the rotation of the heads of said characters.

4. The image processing device according to Claim 1, wherein said determination means includes means for computing the angle from said characters to the target based on coordinate values of said characters and said target in said virtual three-dimensional space.

5. The image processing device according to Claim 1, wherein there are a plurality of said objects, and said determination means includes determination means for determining to which of said plurality of targets the eye direction should be directed according to said game situation.

6. An image processing method for displaying the behavior of characters modeled on opponents in virtual three-dimensional space, wherein said image processing method is characterized in that a determination is made as to whether or not there exists a certain situation in which the relation to the game contents or the positional relation between characters and a target having a relation through the game to said characters matches certain conditions, and the eyes of said characters are directed to said target when it has been determined that the certain situation exists.

7. An image processing method for displaying the behavior of characters modeled on opponents in virtual three-dimensional space, wherein said image processing

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method is characterized in that a determination is made as to whether or not certain conditions have been established while said character is made to execute a first behavior, and said character is made to execute a second behavior when said certain conditions have been established, so that data of the developing game situation is suggested to the player.

8. An image processing device for displaying the behavior of display objects in virtual three-dimensional space, wherein said image processing device is characterized by comprising:

a plurality of polygons in which textures are individually mapped to a plurality of display objects, said plurality of polygons being virtually superposed;

and polygon oscillation means for moving the plurality of polygons along planes intersecting the directions in which the polygons are superposed.

9. The image processing device according to Claim 8, wherein said plurality of polygons are virtually superposed, while the plurality of polygons that form the various plurality of objects are interleaved according to the sequence of objects, and said polygon oscillation means is a means for periodically moving said plurality of objects while synchronized and linked with each object.

10. The image processing method according to Claim 9, wherein said moving direction is the vertical or lateral direction of said polygons.

11. An image processing method for displaying the behavior of display objects in virtual three-dimensional space, wherein said image processing method is characterized in that a plurality of polygons individually mapped with textures modeled on a plurality of display objects are virtually superposed, and said plurality of polygons are moved in directions intersecting the directions in which the polygons are superposed.

12. An image processing device for simulating and displaying games in virtual three-dimensional space, wherein said image processing device is characterized by comprising:

sensing means for sensing the time of said game being played by a player; and

adjusting means for adjusting the screen colors of said images according to the time sensed by the sensing means.

13. The image processing device according to Claim 12, wherein said adjusting means comprises memory means by which values for screen colors of at least two standard time zones established for situations suited to the game are stored in the form of various reference values; and data generating

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means which, when the time sensed by said sensing means is within either of said standard time zones, generates masking data for the game display screen based on the corresponding one of said reference values, and which, when said time is not within either of said standard time zones, generates said masking data based on information for the screen color state interpolated on the basis of the two reference values temporally prior to and following said time in said at least two reference values.

14. An image processing method for simulating and displaying games in virtual three-dimensional space, wherein said image processing method is characterized by sensing the time of said game being played by the player, and by adjusting the screen color of said images according to said time.

15. An image processing method in which a display object modeled on a living creature in virtual three-dimensional space is displayed on a display screen, as the perspective is changed from a given point of view, wherein said image processing method is characterized by the steps of:

comparing the position of an imaginary point determined in said virtual space and the position of said display object;

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determining whether or not the results of said comparison match certain conditions set by a program; and

establishing said imaginary point as the main point of view of said display object when the results of said match said certain conditions.

16. An image processing method in which a display object modeled on a living creature in virtual three-dimensional space is displayed on a display screen, as the perspective is changed from a given point of view, wherein said image processing method is characterized by the steps of:

comparing the position of a plurality of imaginary points determined in said virtual space and the position of said display object; and

selecting said imaginary point as the main point of view of said display object.

17. An image processing device for situating objects in virtual space formed by a computer system, developing a game while controlling the movements of said objects according to input control and set rules, and displaying circumstances in said virtual space as the screen seen from a virtual camera, wherein said image processing device is characterized by comprising:

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polygons situated on a reference plane serving as the reference in said virtual space;

determination means for determining the positional relation between said polygons and said virtual camera; and

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polygons tilting means for tilting said polygons, according to the results of the determination, so as to increase the surface area of said polygons seen from said virtual camera.

18. The image processing device according to Claim 17, wherein said reference plane is the ground, and said polygons are polygons forming lines situated on said ground.

19. The image processing device according to Claim 17, wherein said polygons are quadrilateral, and said polygon tilting means modifies the coordinate values of the vertices on one of the sides of mutually facing sides of said polygons.

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20. An image processing device for situating objects in virtual space formed by a computer system, developing a game while controlling the movements of said objects according to input control and set rules, and displaying circumstances in said virtual space as the screen seen from a virtual camera, wherein said image processing device is characterized by comprising:

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determination means for determining whether or not said objects are in a specific area in said virtual space; and

camera angle adjusting means for adjusting the angle of said virtual camera based on the results of said determination.

21. The image processing device according to Claim 20, wherein said camera angle adjusting means adjusts the angle of said virtual camera based on the results of said determination and the direction in which said objects are moving.

22. The image processing device according to Claim 20 or 21, wherein said camera angle adjusting means adjusts the angle of said virtual camera in at least one of either the lateral and vertical directions in said virtual space.

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23. An image processing device for situating objects in virtual space formed by a computer system, developing a game while controlling the movements of said objects according to input control and set rules, and displaying circumstances in said virtual space as the screen seen from a virtual camera, wherein said image processing device is characterized by comprising:

determination means for determining whether or not said objects are in a specific area in said virtual space; and



zoom adjusting means for adjusting the range of the field of vision of said virtual camera based on the results of said determination.

24. An image processing device having an image generating display means for converting virtual space constructed with a three-dimensional model consisting of a plurality of polygons to two-dimensional images seen from a virtual camera in any position, and displaying them on a display device, wherein said image processing device comprises:

angle computing means for computing the angle between an eye direction vector showing the direction in which said virtual camera is facing and a normal line vector showing the orientation of the plane of certain polygons situated in said virtual space; and

polygon tilting means for changing the coordinate values of the vertices of said polygons, so that the angle computed by said angle computing means assumes a certain value.

25. An image processing device having image generating display means for generating two-dimensional images that reveal, from any point of view, virtual space constructed with a three-dimensional model consisting of a plurality of polygons, and for displaying them on a display device, said

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polygons comprising nondisappearing polygons which have attributes preventing them from disappearing and which contain data for operating a program to prevent polygons from disappearing;

said disappearance prevention program comprising position determination means for determining the positional relation between said nondisappearing polygons and said point of view, and coordinate modification means for modifying the coordinate values of the vertices of said nondisappearing polygons according to the results of the determination by said position determination means; and

said image processing device furthermore comprising disappearance prevention execution means for executing said disappearance prevention program when the polygons visualized on said display device are said nondisappearing polygons.

26. Data recording media on which has been recorded a program for allowing a computer system to function as an image processing device according to ~~any of Claims 1 through 8, 9, 12, 13, and 17 through 25.~~

27. An image processing device for displaying circumstances in virtual three-dimensional space in the form of images seen from a camera, wherein said image processing device comprises:

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polygons situated on a reference plane serving as reference in said virtual three-dimensional space;

determination means for determining the positional relation between said polygons and said virtual camera; and

polygons tilting means for tilting said polygons, according to the results of the determination by said determination means, so as to increase the surface area of said polygons seen from the virtual camera.

28. An image processing device for displaying circumstances in virtual three-dimensional space in the form of images seen from a virtual camera, wherein said image processing device comprises:

polygons situated on a reference plane serving as reference in said virtual three-dimensional space;

determination means for determining the positional relation between said polygons and said virtual camera; and

polygons tilting means for tilting said polygons, according to the results of the determination by said determination means, so as to allow the vertices in the interior, relative to said virtual camera, of said polygons to stand out from said reference plane, while centered on the vertices in the front, relative to said virtual camera, of said polygons.

A 29. A game machine, characterized by comprising an image processing device according to Claim 27 ~~or 28~~, for executing a game by situating objects in said virtual three-dimensional space and by controlling said objects according to player input control and set rules.

Sub D4 30. The game device according to Claim 29, characterized in that said game is a game in which objects are situated in a game field formed on a reference plane, and said polygons are polygons forming lines described on said game field.

Sub B3 31. An image processing device for displaying circumstances in said virtual three-dimensional space in the form of images seen from a virtual camera, wherein said image processing device comprises:

polygons situated in said virtual three-dimensional space;

determination means for determining the positional relation between said polygons and said virtual camera; and

polygon tilting means for tilting said polygons, according to the results determined by said determination means, so as to increase the surface area of said polygons seen from the virtual camera.

A 32. The image processing device according to Claim 27, ~~28, or 31,~~ characterized in that said polygons are polygons that show lines.

33. A game device, characterized by comprising an image processing device according to Claim 31, for executing a game by situating objects in said virtual three-dimensional space and by controlling said objects according to player input control and set rules.

34. The game device according to Claim 33, characterized in that said game is a game in which objects are situated on a plane, and said polygons are polygons forming lines described on said plane.

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